BONNEVILLE
POWER ADMINISTRATION

Transmission Business Line (TBL)
Available Transfer Capability Methodology

Revised March 15, 2004

3/15/04 Revisions Summary This revision updates Appendix 4, Section 3 of the ATC Methodology to reflect updates to the *De Minimis* impact dead-band.	1. *De minimis definition modified to accommodate offers associated with pending transmission service.* 2. *Clarification of de minimis application to multiple POR/POD requests and small generator projects of 4 MW or less.* 3. *Adoption of commitment to tracking de minimis impacts at Network Flowgates and reporting results.*
2/11/04 Revisions Summary This revision updates several of the ATC Methodology appendices due to a new power flow base case study and revised ATC results.	1. *Appendix 1 – Flowgate map updated; West of Slatt Flowgate added; North of Hanford and Cross Cascades North Flowgates updated to reflect new infrastructure.* 2. *Appendix 3 – Edited to reflect updated information.* 3. *Appendix 5 – PUFs for 2006 infrastructure added.* 4. *Appendix 6 –New Power Flow Base Case and assumptions based on 2006 infrastructure.* 5. *Appendix 7 –Illustrative ATC results updated for 2004 - 2022.*

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A. Introduction

The Bonneville Power Administration ("Bonneville") owns the Federal Columbia River Transmission System ("FCRTS"). Bonneville's Transmission Business Line ("TBL") provides transmission services over the FCRTS under the TBL's Open Access Transmission Tariff ("Tariff") and other grandfathered contracts. The FCRTS is used to deliver power between resources and loads within the Pacific Northwest, and to transmit power between and among the Pacific Northwest region, western Canada and the Pacific Southwest. The FCRTS is comprised of Bonneville's main grid network facilities ("Network"), including constrained paths interconnecting with other transmission systems ("External Interconnections"[1]); Interties;[2] delivery facilities; and generation interconnection facilities.

TBL's Tariff provides that an Available Transfer Capability ("ATC") methodology will be posted on the OASIS. Increased use, load growth and new generation interconnecting with the FCRTS have caused the TBL to operate the existing Network at or near its physical limits. As a result, the TBL has developed a new methodology, consistent with NERC and WECC criteria, to calculate ATC for long-term service on internal Network flowgates by measuring the impact of existing long-term service and proposed transmission requests on such paths. The new ATC methodology combines a planning methodology that measures physical flows on the Network with a contract accounting methodology that reflects contractual obligations. The new ATC methodology is for long-term service, and is called the "Combined Planning/Accounting Methodology".

The Combined Planning/Accounting Methodology was developed to establish a single method that TBL will use to determine ATC values on constrained paths internal to the Network ("Network Flowgates") for such needs as system planning, system operations, and transmission marketing. [3] This Network Flowgate approach evaluates transfer capability by monitoring transaction impacts on defined transmission facilities. See Appendix 1 for a map and description of TBL's Network Flowgates.

The Combined Planning/Accounting Methodology will be used for ATC determinations for the Network Flowgates only. The ATC determination for Interties and Network External Interconnections[4] will continue to use a Contract Accounting Methodology as described in Appendix 2.

B. ATC Methodology for Network Flowgates

A combination of planning studies and contract accounting is used to determine the existing uses of each Network Flowgate. The following is a step-by-step explanation of

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[1] Northern Intertie, Malin-Hilltop, West of Hatwai, West of Garrison and LaGrande paths. Although West of Hatwai is a network flowgate, it is treated as an external interconnection because its operating characteristics are similar to an external interconnection and this path has historically been treated as such.

[2] Southern Intertie (AC transmission lines and DC transmission lines) and Montana Intertie.

[3] In developing the ATC Methodology for Network Flowgates, TBL held informal consultations with various customer groups participating in open meetings as a part of Contract Lock discussions. For more information see http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/.

[4] Northern Intertie, AC Intertie, DC Intertie, West of Garrison, Reno-Alturas Transmission System, West of Hatwai, LaGrande

how the Combined Planning/Accounting Methodology is used to calculate ATC for each Network Flowgate.

1. **Determine Total Transfer Capability for Each Network Flowgate.**

   The Total Transfer Capability (TTC) for each Network Flowgate represents the transfer capability of the Bonneville-owned transmission lines and associated facilities comprising such Network Flowgate. See Appendix 3 for determination of TTC for Network Flowgates.

2. **Compute the Contract Accounting ATC.**

   Contract Accounting ATC = TTC – Contract Accounting Flow

   The Contract Accounting Methodology evaluates existing long-term firm transmission contracts, including grandfathered contracts (Formula Power Transmission (FPT), Integration of Resources (IR), and other pre-order 888 agreements); Network Integration Transmission (NT); and Point-to-Point (PTP) contracts, and maps their contract rights to each of the Network Flowgates using the Path Utilization Factors. See Appendices 2 and 5 for Contract Accounting Methodology and Path Utilization Factors, respectively.

3. **Compute the Planning ATC.**

   Planning ATC = TTC – Planning Power flow

   Planning power flows for the months January, May, June, and August are computed using base case assumptions. See Appendix 6 for power flow base case information.

4. **Compute the Delta between the Contract Accounting ATC and the Planning ATC for each month.**

   Delta = Planning ATC – Contract Accounting ATC

   The Contract Accounting ATC for the months of January, May, June, and August is subtracted from the Planning ATC for the same months to compute the delta for those months, which may have a positive or negative value. The delta for each of those months is used as the delta value for the other months in the corresponding season.[5]

5. **Determine the Combined Planning/Accounting ATC.**

   Combined Planning/Accounting ATC = Contract Accounting ATC + Delta

6. **Determine Transmission Reliability Margin.**

   Transmission Reliability Margin (TRM) is margin inserted into the ATC calculation to account for nomograms, load forecast error, and inherent modeling uncertainty. See Appendix 4 for the TRM Methodology for each Network Flowgate.

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[5] January delta applies November – February; May delta applies April –May; June delta applies to June only; August delta applies July – October. March delta is the average of the January and May deltas.

7. **Calculate Final ATC.**

Final ATC = Combined Planning/Accounting ATC - TRM

See Appendix 7 for Final ATC results.

C. Consistency with NERC/WECC ATC Methodologies

The Combined Planning/Accounting ATC Methodology is consistent with the NERC and WECC standard for computing ATC. The standard NERC/WECC method for computing ATC is given by the equation:

ATC = TTC – Committed Uses

Where Committed Uses = existing transmission commitments + Transmission Reliability Margin

The steps described in Section B can be restated in the following equation:

Final ATC = TTC – Contract Accounting Flow + Delta – TRM

The "existing transmission commitments" component of the NERC/WECC formula is calculated using the contract accounting flows and the delta between the Contract Accounting ATC and the Planning ATC.

D. Management of ATC Between Planning Baseline Studies

The TBL will run planning studies to update long-term Final ATC baseline amounts for the Network Flowgates at least once per year. In the interim, requests for new transmission will be evaluated by determining the use that the new request makes of each Network Flowgate using the Contract Accounting Methodology. If, at each Flowgate, there is either (1) sufficient ATC based on the latest baseline Final ATC calculations, or (2) the request qualifies as having a *de minimis* impact on that Flowgate, then the request will be granted. Where there is insufficient ATC, System Impact or other Studies, as specified by the Tariff, would be required. When a new request is granted, the baseline Final ATC for each Flowgate (except those with *de minimis* impact) will be decremented by the new transaction's use of the Flowgate as determined by the Contract Accounting Methodology.

When the next long-term ATC baseline amounts are calculated, any new long-term firm arrangements, including those with *de minimis* impacts, will be included in the planning studies and contract accounting analysis, and incorporated into the Final ATC results for each Flowgate.

E. Modifications to ATC Methodology

The TBL will provide notice and a brief comment period for modifications proposed to the following:

1. The arithmetic formulas described in Sections B(2) through B(7) above used to calculate ATC using the Combined Planning/Accounting Methodology described herein;
2. The methodology for determining load forecasts described in Section 2(b) of Appendix 6;
3. The generation dispatch levels of federal hydro projects for NT load service described in Section 2 of Appendix 2, and Section 2(c) of Appendix 6; or
4. The netting assumptions described in Section 2 of Appendix 2.

Proposed modifications not expressly identified in this Section E will not be subject to such notice and comment.

F. Definitions

Available Transfer Capability (ATC): A measure of the transfer capability remaining in the physical transmission network for further commercial activity, over and above already committed uses.

Flowgate (Cutplane): Transmission lines and facilities owned by Bonneville on a constrained portion of Bonneville's internal network transmission grid.

Operational Transfer Capability (OTC): The amount of power that can be reliably transmitted through a transmission path given current or forecasted system conditions.

Path: A Point of Receipt (POR)/Point of Delivery (POD) combination.

Path Utilization Factor (PUF): The portion of power that will flow on a particular flowgate as it moves from a specific POR to a specific POD.

Total Transmission Capability (TTC): The amount of electric power that can be transferred over the interconnected transmission network in a *reliable* manner while meeting *all* of a specific set of defined pre- and post-contingency system conditions.[6] References to TTC shall also mean TBL's share of defined paths.

Transmission Reliability Margin (TRM): That amount of transmission transfer capability necessary to provide a reasonable level of assurance that the interconnected transmission network will be secure under a broad range of uncertainties.[7]

[6] Western Electric Coordinating Council, NERC/WECC Planning Standards and Minimum Operating Reliability Criteria, Definitions, Revised August 9, 2002.

[7] Western Electric Coordinating Council, Determination of Available Transfer Capability Within the Western Interconnection, June 2001.

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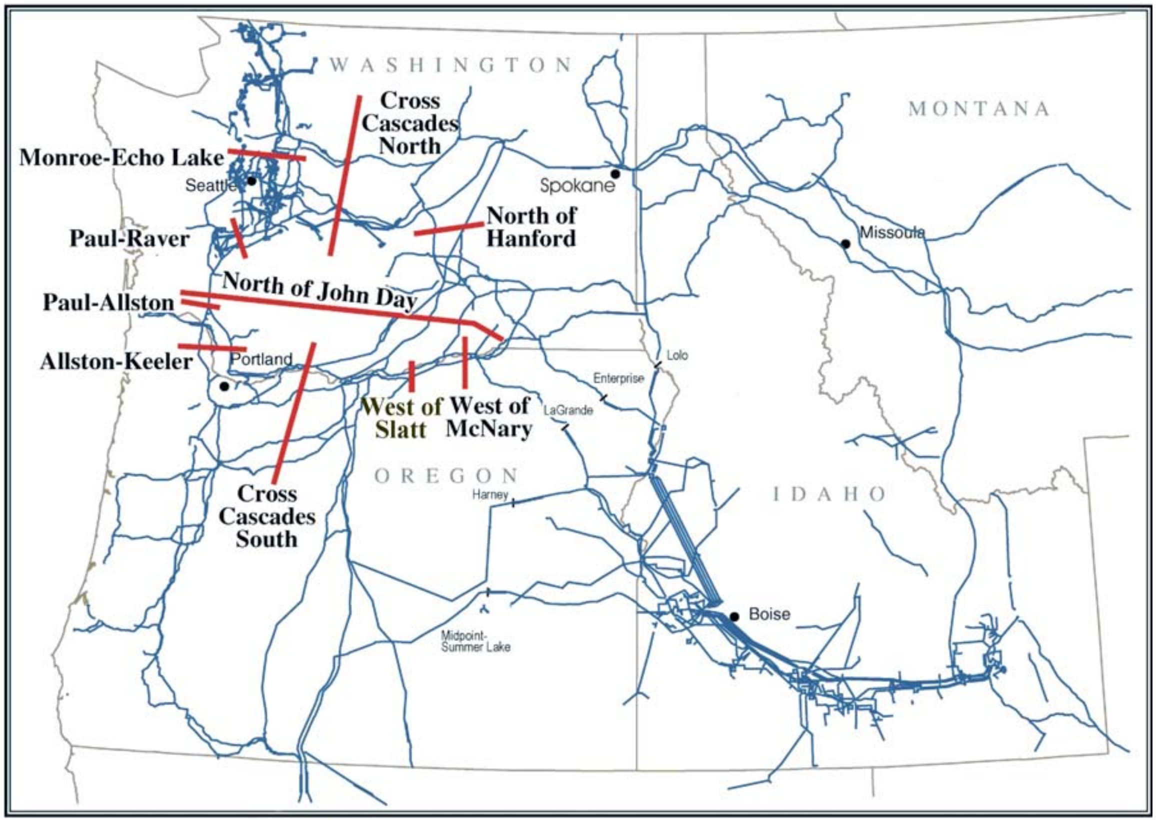
Appendix 1 - TBL Network Flowgate Map and Descriptions

1. Network Flowgate Map.



2. TBL Network Flowgate Descriptions.

   Pursuant to this methodology, TBL has identified Network Flowgates listed below for posting. TBL will continue to identify and evaluate other network Flowgates and post them in accordance with this methodology and its Tariff.

   a. Monroe-Echo Lake Flowgate consists of the Monroe-Echo Lake 500kV Line (north-to-south).

   b. Raver-Paul Flowgate consists of the Raver-Paul 500 kV Line (north-to-south).

   c. Paul-Allston Flowgate consists of the following transmission lines (north-to-south):

      - Napavine-Allston #1 500kV;and
      - Paul-Allston #2 500kV.

   d. Allston-Keeler Flowgate consists of the Allston-Keeler 500kV Line (north-to-south).

e. North of Hanford Flowgate consists of the following transmission lines (north-to-south):

- Vantage-Hanford 500kV;
- Grand Coulee-Hanford 500kV; and
- Shultz-Wautoma 500kV (effective upon energization in 2006)

f. North of John Day Flowgate consists of the following transmission lines (north-to-south):

- Ashe-Marion 500kV;
- Ashe-Slatt 500kV;
- Hanford-Ostrander 500kV (to become Wautoma-Ostrander 500kV after Shultz-Wautoma 500kV energization);
- Hanford-John Day 500kV (to become Wautoma-John Day 500kV after Shultz-Wautoma 500kV energization);
- Raver-Paul 500kV; and
- Lower Monumental-McNary 500kV.

g. West of McNary Flowgate consists of the following transmission lines (east-to-west):

- Coyote Springs-Slatt 500kV;
- McNary-Ross 345kV;
- McNary-Horse Heaven 230kV; and
- McNary-Santiam 230kV.

h. Cross Cascades North Flowgate consists of the following transmission lines (east-to-west):

- Schultz-Raver #1, 3, & 4 500kV;
- Schultz-Echo Lake #1 500kV;
- Chief Joseph-Monroe 500kV;
- Chief Joseph-Snohomish #1 & 2 345kV;
- Rocky Reach-Maple Valley 345kV;
- Grand Coulee-Olympia 287kV; and
- Columbia-Covington 230kV.

i. Cross Cascades South Flowgate consists of the following transmission lines (east-to-west):

- Big-Eddy-Ostrander 500kV;
- Ashe-Marion 500kV;
- Buckley-Marion 500kV;
- Hanford-Ostrander 500kV;
- John Day-Marion 500kV;

- McNary-Ross 345kV;
- Big Eddy-Chemawa 230kV;
- Big Eddy-McLaughlin 230kV;
- Midway-North Bonneville 230kV;
- McNary-Santiam 230kV; and
- Parkdale-Troutdale 230kV.

j. West of Slatt Flowgate consists of the following transmission lines (east-to-west):

- Slatt-Buckley 500kV; and
- Slatt-John Day 500kV;

3. The TBL reserves the right to modify the Network Flowgate designations at any time.

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Appendix 2 - Contract Accounting Methodology

1. Contract Accounting Methodology.

   The Contract Accounting Methodology is used to determine ATC for Interties and external interconnections, and to assess the impact of requests for transmission across Network Flowgates in the interim between power flow study cycles. The application of this methodology to Network Flowgates is discussed in Sections 2 through 4 of this Appendix. See Section 5 of this Appendix for special assumptions for Interties and external interconnections.

2. Contract Accounting Methodology Assumptions.

   The Contract Accounting Methodology assumptions include:

   - Limited netting:
     - Some netting across the Network Flowgates for NT and PTP/IR/FPT contracts serving load in the Pacific Northwest is based on historical Light Load Hour data.

       For PTP, FPT, and IR contracts, POR/POD combinations serving load in the Pacific Northwest, netting for each Network Flowgate is based on a ratio of monthly loads in Light Load Hours to winter loads in Heavy Load Hours. For NT contracts, netting for POR/POD combinations for each Network Flowgate is based on a ratio of monthly loads in Light Load Hours to monthly loads in Heavy Load Hours.
     - All other contracts with firm transmission to loads outside of the Pacific Northwest (such as contracts delivering to the head of the AC Intertie) are assumed to use their full contract demand simultaneously on Bonneville's share of the transmission system.
   - Non-coincident (by individual POD) normal 1-in-2 year (that is, the probability of actual loads exceeding the forecast is estimated to be .5) monthly peak load forecasts are used for NT contracts. Cut Case PUF value. Path Utilization Factors are derived from a model of Bonneville's system only, not the entire WECC loop (commonly referred to as a "cut case").
   - Federal Resource Dispatch:
     - Modified 90th Percentile Method for federal dispatch for NT service.

       The amount of NT load served by federal resources is determined by decrementing the NT load forecast by the amount of the Customer-Served Load and non-federal NT resources serving such load, as specified in the NT Service Agreements. NT contracts do not identify the amount of transmission from specific federal Network Resources to Network Load. Because dispatch patterns for federal Network Resources can vary, assumptions are necessary for determining power flow analysis described in Section 2(c) of Appendix 6. These assumptions used the Modified 90th Percentile Method in the Contract Accounting Methodology.

- Additional adjustments for federal resource flexibility.

  Additional adjustments are made to allow for operational flexibilities to balance the federal hydro system to meet non-power obligations. These adjustments were made to the Contract Accounting Flow as follows: 200 MW on the North of Hanford Flowgate for March through September; 100 MW on the Cross Cascades North Flowgate for June through September; and 200 MW on the Cross Cascades South Flowgate for June through September.

3. Mapping the Impact of Each Contract Across Each Network Flowgate.

Contract Accounting Flow = POR/POD demand x PUF

The Contract Accounting Methodology evaluates individual NT, PTP, and grandfathered contracts (IR, FPT, and other contracts--including agreements where TBL provides transmission service to IOU loads located in BPA's Control Area, and obligations to the USBR to serve irrigation pumping load) and maps their respective rights onto each of the Network Flowgates, external interconnections, or Interties using the Path Utilization Factors.

The impact of each contract over each Network Flowgate ("Contract Accounting Flow") is the product of the demand (or load forecast for NT) for each POR/POD combination multiplied by the PUF value for that corresponding flowgate. In cases where there are multiple PORs and PODs, the contract demand for PTP, IR or FPT contracts was proportionately allocated to the PORs and PODs as shown in Section 6 below of this Appendix.

4. Determine Contract Accounting ATC.

Contract Accounting ATC = TTC – Contract Accounting Flow

To obtain the Contract Accounting ATC, the sum of the Network Flowgate impacts, including the adjustments described in Sections 2 and 3 above (Contract Accounting Flow), is subtracted from the TTC of each Network Flowgate.

5. External Interconnections and Interties.

The ATC for external interconnections and interties is calculated using the results of the Contract Accounting Methodology, without adjustments for planning study results. The Contract Accounting Methodology applicable to Interties and external interconnections modifies two key assumptions. First, netting is assumed for only the West of Hatwai and LaGrande external interconnections. In the case of West of Hatwai, the netting approach described in this Appendix 2 is employed. In the case of LaGrande, federal generation serving grandfathered and Network Loads in southern Idaho is netted against peak loads in that area to calculate the ATC for LaGrande in the west-to-east direction. Second, for all other transactions using an intertie or external interconnection, the full amount of the load forecast or contract demand is deducted from the ATC (except for the previously mentioned netting).

6. Multiple POR/POD Evaluation Example.

Some contracts contain multiple PORs and PODs. In order to use the PORs to calculate flowgate flows, the total contract demand must be allocated among all possible POR/POD combinations. The following is an example of how contract demand for PTP or IR contracts was proportionately allocated in cases where multiple POR/POD combinations were possible.

Multiple to Multiple PTP Example							
Hypothetical Long Term Contract for 2000MW							
	POR	**MW**		**POD**	**MW**		
	A	1000		X	1200		
	B	650		Y	300		
	C	50		Z	500		
	D	300					
		2000			2000		
Allocation of POR Demands to the POD's							
			PODs				
	2000		**X**	**Y**	**Z**		
			1200	**300**	**500**		
PORs	**A**	**1000**	600	150	250		1000
	B	**650**	390	97.5	162.5		650
	C	**50**	30	7.5	12.5		50
	D	**300**	180	45	75		300
			1200	300	500	2000	2000

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Appendix 3 - Determination of Total Transfer Capability (TTC) for Network Flowgates

1. The TBL determines TTC on a seasonal basis for use in long-term ATC calculations. A power flow base case is compiled using expected seasonal operating conditions. The worst contingency outages as defined by the WECC, NERC, and Bonneville Reliability Standards are studied to ensure equipment loadings, voltage stability, and transient stability performance meet these standards. The TTC limit is determined by adjusting the generation pattern to stress the case to the maximum path flow level where the worst-case contingency outages continue to meet the reliability standards.

2. Network Flowgate TTC limits are determined based on the Bonneville transmission facilities for each Network Flowgate that existed or are scheduled to be energized in the appropriate month of each Calendar Year. Such TTC's shall be revised on an on-going basis to reflect system upgrades and expansions.

3. Network Flowgate TTC limits are specified in the link to ATC Results, provided in Appendix 7. Due to national security considerations, studies used to determine TTC will be available to parties that sign a non-disclosure agreement. Information regarding the non-disclosure agreement is available on TBL's website.

4. The TBL reserves the right to modify the TTC determinations at any time subject to the WECC Operating Transfer Capability (OTC) process. The OTC process is set up to allow technical review of transfer path operating limits by affected WECC members. Transfer paths subject to this process are usually external interconnections, but could be any path affecting more than one WECC member system.

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Appendix 4 - Transmission Reliability Margin Methodology & *De Minimis* Impact Dead-Band

The Transmission Reliability Margin (TRM) methodology is applicable to each Network Flowgate except for Flowgates where special case TRM is described.

1. TRM Methodology.

   a. TRM Methodology if Planning ATC is greater than Contract Accounting ATC:

   - If the Planning ATC is greater than the Contract Accounting ATC, the TRM is 25% of the delta.

   b. TRM Methodology if Contract Accounting ATC is greater than Planning ATC:

   - If the Contract Accounting ATC is greater than the Planning ATC, there is no TRM for the Network Flowgate.

2. Special Case TRM.

   a. Raver-Paul Flowgate (netting adjustment):

   For spring and summer seasons[8], the TRM is adjusted to account for generation displacement (based on the impact of one (1) unit each at Centralia and Chehalis off-line during this time period). TRM is adjusted as follows:

   - The TRM for the Raver-Paul Network Flowgate for the spring and summer seasons is a minimum of 300 MW.
   - For seasons other than spring and summer[9], the TRM methodologies described in Section 1 of this Appendix shall apply.

   b. Cross-Cascades North and South (extreme weather adjustment):

   - For the winter season, 1 in 20 loads are assumed in the computation of planning ATC and no TRM adjustment is made.
   - For seasons other than winter, the TRM methodology described in Section 1 of this Appendix shall apply.

   c. North of John Day:

   - The TRM for the North of John Day Flowgate is a minimum of 200 MW in all months based on the nomogram for that Flowgate and the AC Intertie.
   - In addition, if the Planning ATC is greater than the Contract Accounting ATC, then TRM is equal to 200 MW plus 25% of the Delta.

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[8] Spring and summer seasons: Months of March – October.

[9] Seasons other than spring and summer: Months of November - February

3. *De Minimis* Impact Dead-Band.

For each transmission request using a Network Flowgate where the PUF value is less than or equal to 10 percent **and** the resulting impact on the flowgate is less than or equal to 10 MW, then the transmission request will be deemed to have a *de minimis* impact on that Network Flowgate, and the impact on that flowgate will be ignored. ATC over that Network Flowgate will not be decremented for that transaction but the impact will be added to a dead-band bucket. Between ATC updates, TBL will manage the total *de minimis* impacts on a Network Flowgate to minimize the risk of exceeding 2 percent of the TTC of such Network Flowgate **or** 50 MW, whichever is less.

For the **total** offers associated with pending transmission service requests at any time (including offers or agreements for System Impact Studies, System Facility Studies, financing agreements for required transmission construction and transmission service agreements), the *de minimis* impact on the Network Flowgate shall not exceed 5 percent of the TTC of such Network Flowgate **or** a total *de minimis* impact dead-band of 100 MW, whichever is less. When accepted offers reach the lesser of 2 percent of the Flowgate TTC or 50 MW, all new offers for transmission service will be suspended until ATC becomes available.

a. *Multiple POR/POD Transmission Requests*

   For requests for transmission service involving multiple POR and POD pairs, each POR/POD combination will be evaluated separately to determine the impact on the affected Network Flowgates, including *de minimis* impacts. Where ATC, including *de minimis* impacts, is not available for some POR/POD combinations but is available for other POR/POD combinations, partial service over the available flowgate will be offered in accordance with the Partial Service Business Practice.

b. *Small Generator Nameplate Less Than or Equal to 4 MW*

   For transmission service from a new generator project at a single point of receipt having single or multiple PODs for single or multiple transmission customers, that has a total nameplate rating of less than or equal to 4 MW, the PUF value for determining applicability of *de minimis* impact on the flowgate will be suspended. All such requests will be evaluated in queue order and granted provided that the *de minimis* impact dead-band is available on the affected Network Flowgate.

   Between ATC updates, the total for these small generator-based *de minimis* impacts on a Network Flowgate will not exceed 1 percent of the TTC of such Network Flowgate **or** 25 MW, whichever is less. The total for **all transmission requests** with *de minimis* impacts on a Network Flowgate ATC will not exceed 2 percent of the TTC of such Network Flowgate **or** 50 MW, whichever is less.

TBL will track the status of the *de minimis* impact dead-band at each Network Flowgate and, at least once each year or when base case planning studies are updated, report the results.

4. The TBL reserves the right to modify the TRM and *de minimis* impact dead-band methodologies at any time.

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Appendix 5 - Path Utilization Factors (PUF)

Path Utilization Factors may be found at:

PUFs effective through April 2006 (originally posted November 12, 2003):
http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/PUFTblsCutSystm_11-12-03.xls

PUFs effective May 2006 due to infrastructure additions:
http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/PUFTblsCutSystm_02-11-04.xls

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Appendix 6 - Power Flow Base Case

1. Power Flow Model.
   a. The power flow model is a mathematical representation of the actual lines, transformers, loads, and generators that comprise the Columbia River Power system. A key output of this model is a computation of how much power will flow over each element in the power system for the assumed load and generation levels.
   b. For the planning ATC calculations, power flows representing projected system conditions in each calendar year were modeled. Subsequent analysis will use base cases that reflect new or changed system conditions, particularly the addition of major new transmission facilities.
   c. Northwest generation levels and load were limited to firm commitments on the Bonneville transmission system to the extent possible. Since this creates a discrepancy between total Northwest generation and load, Intertie flows were adjusted accordingly.
   d. The power flows over Network Flowgates were identified.
   e. The difference between the power flow and the TTC becomes the Planning ATC for the flowgate. One Planning ATC is established per flowgate, per season.
2. Power Flow Base Case Assumptions.
   a. Representative seasonal power flow cases were developed.
   b. Normal peak (I in 2 year) load forecasts were used for all seasons. For the winter season, an additional power flow base case using extra heavy loads (1 in 20 year) was developed. The extra heavy loads were used in determining the planning ATC for the Cross Cascades Flowgates.
      1. Load forecasts for utilities that perform their own forecasts were obtained from such utilities as part of the TBL's standard process for base case development.
      2. Load forecasts for utilities that do not do their own load forecasts were based on forecasts developed by the TBL.
   c. Federal generation levels were set using a multiple step process. The Columbia Generating Station (formerly known as WNP-2) was assumed to be on-line at full load in the power flow cases in all seasons (in the Contract Accounting Methodology, however the plant was assumed to be off-line for maintenance during the months of April and May in the odd-numbered years). The portion of the plant's output that was not covered under federal PTP contract demand was deemed to serve all contracts that call out non-specific federal projects as PORs.

Generation levels at each of the federal hydro projects[10] were set by first determining each project's 90th percentile generation value by month for the period 1997 – 2002. The 90th percentile value means each such project was at or below these generation levels 90% of the time during the given month. Generation levels at the Libby, Hungry Horse, Dworshak, and Albeni Falls projects, however, were set based on the requirements set forth in the 2002 Biological Opinion. In addition, the generation levels at the Willamette Valley projects were set at the minimum levels seen by season during Calendar Year 2001 as shown below:

Willamette Valley Projects 2001 Generation Seasonal Averages[11]

	Winter	Spring	Summer	Fall
Big Cliff	8	15	3	3
Cougar	8	14	11	14
Detroit	40	44	48	31
Dexter	4	10	0	0
Foster	7	12	4	7
Green Peter	28	24	23	23
Hills Creek	8	8	10	7
Lookout Point	35	45	38	23
Lost Creek[12]	15	24	21	10
Sum	153	196	158	118

The generation at the federal hydro projects was then scaled to match the sum of the demands for all contracts that call out non-specific federal hydroelectric projects as PORs after adjusting these demands for the portion served by Columbia Generating Station, Libby, Hungry Horse, Dworshak, Albeni Falls, and the Willamette Valley projects. The federal PTP demands at each project were then added to this result to obtain the final assumed generation level for each federal hydro project. This overall method for modeling the federal resources is referred to as the "Modified 90th Percentile Method" and is used in both the power flow base cases and Contract Accounting Methodology.

d. Generation levels at the non-federal Mid-Columbia hydro projects were set at 90% of their historical output by season.

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10 Federal hydro projects include: Grand Coulee, Chief Joseph, Dworshak, Albeni Falls, Libby, Hungry Horse, Lower Granite, Lower Monumental, Little Goose, Ice Harbor, McNary, John Day, The Dalles, Bonneville, Willamette Valley Projects.

11 Calendar Year 2001 was used because its averages were the lowest of the last 6 years. Winter: December – March; Spring: April – May; Summer: June – September; Fall: October – November.

12 Most recent data for Lost Creek is 1996. Data between 1996 and 2001 for Hills Creek and Lookout Point followed a pattern that was applied to Lost Creek's 1996 data to arrive at numbers used here. Hills Creek and Lookout Point were used as models due to their regional proximity to Lost Creek.

e. Non-federal thermal generators requiring transmission service on the federal transmission system were set at either their contract demand or seasonal capability, whichever was lower.

f. Non-federal resources that do not require transmission service from the TBL were set at levels obtained from such resource owners as part of the TBL's standard process for power system planning studies.

g. A summary of power flow assumptions can be found at:

- 2004 Base Case Assumptions effective through April 2006 (originally posted November 12, 2003): http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/ATC_BC_Assump_11-12-03.xls
- 2006 Base Case Assumptions effective May 2006: http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/ATC_BC_Assump_02-11-04.xls

3. Determining Planning ATC.

The power flow base cases for each season were run using the assumptions described in Section 2 of this Appendix. The resulting flows across each Network Flowgate ("Planning Power Flow") were obtained and compared to each flowgate's TTC. The difference between the flowgate TTC and the Planning Power Flow is the "Planning ATC".

4. Parallel Flows.

The Network Flowgates do not necessarily represent all transmission lines across that particular constrained portion of the power system. In the Planning power flow studies for determining Planning ATC and TTC for the Network Flowgates, the TBL accounts for power flow across Bonneville facilities only. The flows on all facilities for several constraints follow. The information contained in the following is not intended to establish a formal allocation between the TBL and other transmission owners.

Constraint	CASE				
	MAY04M3 (MW)	JUN04M3 (MW)	A04M3 (MW)	J04M3 (MW)	J04EHM3 (MW)
West of McNary	2598	2511	2310	1852	1788
Coyote Springs - Slatt 500 kV	1801	1733	1578	1145	971
McNary - Ross 345 kV	295	284	260	380	450
McNary - Horse Heaven 230 kV	313	314	296	160	193
McNary - Boardman Tap 230 kV	189	181	176	168	174
South of Allston	2479	2504	2478	766	208
Allston - Keeler 500 kV	1369	1401	1420	122	-239
Lexington - Ross 230 kV	292	257	250	165	91
Allston - St. Helens 115 kV	75	78	76	42	35
Astoria - Seaside 115 kV	-12	-8	-7	-27	-36

Constraint	CASE				
	MAY04M3 (MW)	JUN04M3 (MW)	A04M3 (MW)	J04M3 (MW)	J04EHM3 (MW)
Trojan - St Mary's 230 kV	286	292	287	129	77
Trojan - Rivergate 230 kV	229	240	236	83	59
Merwin - St. Johns 115 kV	151	159	128	150	111
Clatsop - Lewis & Clark 115 kV	89	85	88	102	110
South of Napavine	1889	1908	1996	550	600
Napavine - Allston #1 500 kV	973	982	1025	325	349
Paul - Allston #2 500 kV	916	926	971	225	251

Notes: (a) The "from" and "to" substations are listed in the direction of positive flow; (b) the underlined substation is where the flow is metered; and (c) numbers are rounded.

5. The TBL reserves the right to modify the Planning ATC at any time.

Transmission Business Line (TBL)
Available Transfer Capability Methodology

Appendix 7 –ATC Results

ATC Results are updated and posted on Bonneville's OASIS in accordance with FERC requirements.

The following ATC spreadsheets are on TBL's website and are only provided as an illustration of the ATC methodology:

- ATC Results issued November 12, 2003: http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/Fin_Cmbnd_ATC_TRM_11-12-03.xls
- ATC Results issued February 11, 2004: http://www2.transmission.bpa.gov/Business/Customer_Forums_and_Feedback/Contract_Lock/Documents/Fin_Cmbnd_ATC_TRM_02-11-04.xls